



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/806,203	06/19/2001	Honchin En	301891US40	3753
22850 7590 03/30/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER CHAMBLISS, ALONZO	
			ART UNIT 2814	PAPER NUMBER

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	03/30/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/30/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary

Application No.

09/806,203

Applicant(s)

EN ET AL.

Examiner

Alonzo Chambliss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25,26,29-32,64,65 and 67-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25,26,29-32,64,65 and 67-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 11/30/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed on 1/12/07 has been fully considered and made of record in the application.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 11/30/06 was filed before the mailing date of the final rejection on 3/24/07. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Response to Arguments

3. Applicant's arguments filed 1/12/07 have been fully considered but they are not persuasive.

In regards to Inagaki failing to teach or suggest a lower metal layer formed on the first resin insulating layer and being flat and level, wherein the lower metal layer has a same pattern as the conductor circuit and comprises at least one metal selected from the group consisting of Al, and Sn, excluding Cu. Inagaki discloses a lower metal layer formed on the first resin insulating layer and being flat and level, wherein the lower metal layer has a same pattern as the conductor circuit and comprises at least one metal selected from the group consisting of Cu (see col. 1 lines 15-25, col. 5 lines 15-67, col. 6 lines 1-67, col. 10 lines 10-20, and col. 11 lines 49-67; Figs 3-10). Wroe is utilized to demonstrate that an epoxy resin material can be substitute for a polyolefin

material and a Cu material when used as a conductor circuit can be substituted by an Al material (see col. 3 lines 8-25 and col. 5 lines 33-40).

Therefore, this action is made **final**.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 25, 26, 29, 64, 69, and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inagaki et al. (US 5,837,155) in view of Wroe et al. (US 4,994,903).

With respect to Claims 25 and 26, Inagaki discloses a resin substrate board 1 having on both sides thereof, first resin insulating layer 4 each comprised of the

Art Unit: 2814

same resin material (i.e. epoxy resin composition). A lower metal layer 8 (i.e. the lowest layer 5) has a conductor circuit 7 made of metal (i.e. copper) and having the same pattern as the lower metal layer, on each of the first resin insulating layer 4. The conductor circuit comprises a metal (i.e. copper). Each of the first resin insulating layers 4 has a flat and level surface (see col.1 lines 15-25, col. 5 lines 15-67, col. 6 lines 1-67, col. 10 lines 10-20, and col. 11 lines 49-67; Figs. 3-10). Inagaki fails to disclose a resin-insulating layer comprising a thermosetting polyolefin resin and a conductor circuit comprising Al. However, Wroe discloses a resin-insulating layer comprising a thermosetting polyolefin that can be substitute for an epoxy resin and a conductor circuit comprising Al that can be substitute for copper (see col. 3 lines 8-25 and col. 5 lines 33-40). Thus, Inagaki and Wroe have substantially the same environment of a dielectric material on the surface of a substrate with a conductor circuit on the dielectric material. Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate an insulating layer made of polyolefin with the device of Inagaki, since the polyolefin would provide reliable electrical insulating layer for the substrate while attached to an Al conductor circuit as taught by Wroe.

With respect to Claim 29, Inagaki discloses the resin insulating layers having a surface (see Figs. 5-10). The limitation "obtained by plasma treatment or corona discharge treatment", is a product by process limitation. If the product in the product-by-process claims are the same as or obvious from a product of the prior art, the claims are unpatentable even though the prior product was made by a different process. See *In re Thorpe*, 227 USPQ 964,966 (Fed.cir 1985). A "product by process" claim is

Art Unit: 2814

directed to the product per se, no matter how actually made, In re Brown, 173 USPQ 685., In re Luck, 177 USPQ 523*, In re Fessmann, 180 USPQ 324*, In re Avery, 186 USPQ 161 ; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue', In re Marosi et al, 218 USPQ 289., and particularly In re Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se, which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear.

With respect to Claim 64, the limitation that: "each of the metal layers are formed by plating, PCD or CVD", is a product by process limitation. If the product in the product-by-process claims are the same as or obvious from a product of the prior art, the claims are unpatentable even though the prior product was made by a different process. See In re Thorpe, 227 USPQ 964,966 (Fed.cir 1985). A "product by process" claim is directed to the product per se, no matter how actually made, In re Brown, 173 USPQ 685., In re Luck, 177 USPQ 523*, In re Fessmann, 180 USPQ 324*, In re Avery, 186 USPQ 161 ; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue', In re Marosi et al, 218 USPQ 289., and particularly In re Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product

produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear.

With respect to Claims 69 and 71, Inagaki discloses wherein the resin substrate board is a copper clad laminate (i.e. a lower metal layer and a conductor circuit) and has a buildup structure on each side of the first and second surfaces of the resin substrate (see col. 1 lines 10-30; Figs. 3-10).

6. Claims 30-32, 67, 68, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inagaki et al. (US 5,837,155) and Wroe et al. (U.S. 4,994,903) as applied to claim 25 above, and further in view of Brandli et al. (U.S. 5,227,012).

With respect to Claim 30, Inagaki-Wroe both fail to disclose each of the conductor circuits having an upper metal layer made of Ni on its surface, wherein the upper metal layer has a second resin-insulating layer. However, Brandli discloses each of the conductor circuits 1' having an upper metal layer 2' made of Ni on its surface, wherein the upper metal layer has a second resin insulating layer 5' (see col. 3 lines 52-63 and col. 4 lines 1-10). Thus, Inagaki-Wroe and Brandli have substantially the same environment of a metal layer attached to a polyimide or polyolefin layer. Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the upper metal layer and second resin insulating layer with the process of Inagaki-Wroe, since the upper metal layer would improve the adhesion between the lower metal layer and the second resin layer as taught by Brandli.

With respect to Claim 31, Brandli discloses a layer 2 made of Cu interposed between the lower metal layer 1 (i.e. made of Al) and the conductor circuit 3 (i.e. made of Au) (see col. 3 lines 49-69; Figs. 1b and 1c).

With respect to Claim 32, Brandli discloses wherein the lower metal layer has a thickness of .01 micrometers (see col. 4 lines 60-64).

With respect to Claim 67, Brandli discloses a first resin insulating layer 5, the lower metal layer 1 on the first resin insulating layer 5 and the conductor circuit on the lower metal layer comprises a unit and the unit is a successive series on the resin substrate (see Fig. 2).

With respect to Claim 68, Brandli discloses on the second resin insulating layer 5', another lower metal layer 1" on the second resin insulating layer, and another conductor circuit made of metal on the another lower metal layer 2" 3" (see Fig. 2).

With respect to Claim 70, Brandli discloses wherein the upper metal layer 2' is formed on the whole surface of the conductor circuit 1' (see Fig. 2).

7. Claim 65 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inagaki et al. (US 5,837,155) and Wroe et al. (U.S. 4,994,903) as applied to claim 25 above, and further in view of Misfeldt (U.S. 3,972,755).

With respect to Claim 65, Inagaki-Wroe both fail to explicitly disclose a thermosetting polyolefin resin having a dielectric constant value of not more than 3 and a dielectric loss tangent value of not more than .05. However, it is well known in the semiconductor industry that the dielectric constant value would be not more than 3 (i.e.

2.10) (see Misfeldt col. 2 lines 40-55). Therefore, one skilled in the art at the time of the invention would readily recognize having a dielectric loss tangent value of not more than .05 in a polyolefin resin since the composition of a polyolefin resin with a dielectric constant of 2.10 would yield a tangent value of not more than .05.

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number

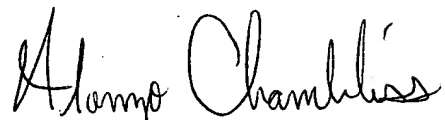
Application/Control Number: 09/806,203
Art Unit: 2814

Page 9

is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application
or proceeding should be directed to the Group receptionist whose telephone
number is (703) 308-7956

AC/March 21, 2007

A handwritten signature in black ink, appearing to read "Alonzo Chambliss". The signature is written in a cursive, flowing style.

Alonzo Chambliss
Primary Patent Examiner
Art Unit 2814